



# Engineering & Computer Science

# BITS

FACULTY NEWSLETTER ♦ JANUARY/ FEBRUARY 1996 ♦ VOLUME 3/ NUMBER 1

## External Advisory Board selected for 1996

*Executive Committee and five departmental sub-committees unveiled*

On November 21, 1995, the Faculty of Engineering & Computer Science proudly unveiled its External Advisory Board (EAB) to the University community. Members of the Board of Governors, senior administration, professoriate, staff and students of Concordia University were on hand to welcome the guests.

The External Advisory Board consists of a total of twenty-nine members. It has an executive committee and five working groups, each affiliated with one of the five academic units in the Faculty. The executive committee comprises nine members: the President and the Vice-President of the External Advisory Board, the Dean of the Faculty; a representative of Concordia's Board of Governors, and the leaders of the five department-affiliated working groups. The working groups themselves are composed of five members, four of whom come from outside the University - one being an alumnus - and the Chair of the department.

The role of the External Advisory Board is to enhance the various partnerships growing between the Faculty of Engineering and Computer Science and the external community. In particular, the Board aims to assist in fostering excellence in academic programmes and research, to ensure their relevance, and to enhance the development of the Faculty's relationship with industry as well as with public and parapublic institutions related to engineering and computer science. The specific objectives of the External Advisory Board are as follows:

- to ensure the Faculty is properly informed as to the expectations of the professions for which it is educating its students
- to help articulate the Faculty's goals, provide advice on strategic planning, and assist in programme development as well as



**The EAB will help enhance the Faculty's relationship with the external community**

the evaluation of its performance.

- to enhance the Faculty's profile in the relevant professional fields
- to provide members of the Faculty's academic community with an effective link to industry and government bodies and individuals

- to assist the Faculty in attracting speakers, lecturers, and visiting faculty from among practicing engineers and computer scientists

Dean Taddeo summed up the role of the EAB in the closing remarks of his speech. "The immediate future holds many challenges for the Faculty and we turn to you, ladies and gentlemen, to help us meet them successfully. How do we continue to prepare our students to be the best in the areas of engineering and computer science and provide them also with the ability to think critically, to communicate properly and to manage effectively? There are no easy answers, as we all know.

There are however, some answers which are better than others. We are confident that with your help, we shall be able to find them together."

### EAB MEMBERS REPRESENT THE FOLLOWING ORGANIZATIONS

Bell Canada	Bombardier Inc.
CIMA +	Innovitech Inc.
Télécité Inc.	Hydro-Québec
SNC-Lavalin Inc.	Franki Canada Inc.
Canadian Space Agency	MPB Technologies
Ringold Enterprises Ltd.	Spar Aerospace Ltd.
Rolls Royce Gas Turbine Engines (Canada) Inc.	
National Research Council of Canada	
Magil Laurentian Realty Corporation	
Bell Northern Research Ltd.	
Société immobilière du Québec (SIQ)	
Canadian Marconi Company	
Ericsson Research Canada	
Le Groupe Informatique MEI	
Pratt & Whitney Canada	
Centre Informatique de Montréal	
Télé globe International Inc.	



# NETWORK TO HELP SOLVE SOIL CONTAMINATION PROBLEMS

*Concordia places five faculty members on unique North American research network*

On October 23, in the presence of members of the federal, provincial and municipal governments, one hundred researchers and students from nine universities throughout the province united to create the Réseau d'expertise sur les sols contaminés (RESOL). Unique in North America, this network of researchers is an association dedicated to solving the environmental problems relating to soil contamination.

Dr. Maria Elektorowicz, Professor of Environmental Engineering in the Department of Civil Engineering, is a member and scientific coordinator of RESOL. Other Concordia faculty members on the team are:

- Prof. P. Anderson (Biology)
- Prof. M. Baldwin (Chemistry)
- Prof. J. Campanelli and Prof. Drolet (Civil Engineering)
- Prof. G. Sassano (Geology)

The remaining research members come from École Polytechnique de Montréal, Institut Armand-Frappier, Biotechnology Research Institute, National Research Council of Canada, Université de Montréal, Université du Québec à Montréal, Université Laval and McGill University.

With this membership of researchers RESOL has established an expertise in the area of soil contamination. Members represent the domains of chemical, civil, and environmental engineering, biology, chemistry, ecotoxicology, geotechnics, soil science as well as law and political analysis.

RESOL provides public and private institutions with information on contaminated products, the types of contamination and the criteria for decontamination. The network will also work with other organizations such as the Centre d'assainissement des sols and the Groupe de développement de l'industrie de l'environnement to present their scientific point of view on various problems of soil contamination. It has a very large program of activities which includes: the exchange of information between internal seminars, Master's, and Ph.D. projects, all relating to contaminated soils; the organization of scientific seminars; technical visits and roundtable discussions; publication of the Bulletin du RESOL; and using the Internet to advertise its expertise.

If interested, other researchers from Concordia University who work in domains



**Dr. Maria Elektorowicz**

related to soil contamination are welcome to join RESOL.

*Requests for membership applications can be made to Dr. Elektorowicz via e-mail at [maria@civil.concordia.ca](mailto:maria@civil.concordia.ca)*

# CANADIAN CHINESE LINKAGE UNIVERSITY PROGRAM

*Dr. A.A. Bulgak represents Concordia in partnership program with China*

Last September, Dr. A. A. Bulgak from the Department of Mechanical Engineering represented Concordia University at the joint directors meeting of the Canada-China University Linkage Program (CCULP) in Nanjing, the People's Republic of China. CCULP was created in 1990 as a network of partnerships between Chinese and Canadian universities. Each partnership consists of a Canadian and a Chinese faculty member equally responsible for directing a joint five-year project. Forty of these partnerships were established when the program began, with each completing a project from a broad selection of fields of study. The programme is funded by the Canadian International Development Agency (CIDA) and administered by the Associations of Universities and Colleges of Canada (AUCC).

Concordia's sister institution is Southeast University in Nanjing, China. The University's Vice President, Dr. He Li Quan is

the project director in China paired with Dr. A. A. Bulgak. Their engineering project was a joint Doctoral Training Programme. Dr. Bulgak was the fourth director appointed to the project since it was begun in 1990 by Dr. Martin Singer, of Concordia, and his responsibility was to ensure that the project was completed this past year.

The meeting was the first time both the

**CCULP was created in 1990 as a network of partnerships between Chinese and Canadian Universities**

Chinese and Canadian project directors had been brought together. Apart from the CCULP members, also present were officials from the AUCC, the State Education Commission of China, the Canadian Embassy in

Beijing and the Quebec delegation to Hong Kong. During the meeting participants discussed issues in higher education from Canadian and Chinese perspectives as well as the benefits and challenges of Canada's academic relations with China.

Dr. Bulgak used the meeting as an opportunity for detailed discussions with Dr. He of the details of the second phase of the CCULP project titled "A Cooperation Program in Advanced Manufacturing Technologies". These details were documented in a proposal signed in Montreal by representatives of Concordia University and Southeast University this past December. If this project is accepted it will be launched under the Special University Linkage Consolidation Program (SULCP). Both Dr. Bulgak and Dr. He agree that the project will involve numerous exchanges of students, scholars and university-industry interactions between Canada and China.



# Engineers of Tomorrow Conference a great success

*Event helps pave the way for women in the field of Engineering & Computer Science*

On January 23, 1996, one hundred young women from ten secondary schools across the island of Montreal took part in the fourth annual Engineers of Tomorrow Conference organized by the Faculty's student association (ECA). The event was sponsored by Ericsson Telecommunications Inc., Bell Sygma and SNC Lavalin Inc. The conference, whose theme was aptly named *Opening the Doors to a Brighter Future*, was designed to introduce female high school students to engineering as an academic and career option.

Guest speakers at the conference included Josée Méthot from Régie intermunicipale de gestion des déchets sur l'île de Montréal who spoke about the accomplishments possible in the engineering industry. Jane Norseworthy from Ericsson Telecommunications Inc. discussed issues dealing with career management and family decisions and Hina Patel, an engineering student from Concordia, spoke about student life and the various fields of Engineering.

Participants of the day-long event toured the Faculty's labs which included Flight Simulation and Robotics demonstra-



**Some of the many participants in Concordia's Fourth Annual EOTC**

tions. The Hands-On Workshops were a great success. Activities included building bridges using a limited amount of material, constructing a simple communication device capable of transmitting morse code as well as the creation of computer logic gates using electrical components. The most popular workshop centered on the development of a protective casing for an egg using only very simple and limited materials which would

prevent the egg from breaking when dropped from a predetermined height.

Organizing committee member Carmen Wong indicated that the event was extremely successful from both sides. "Everything went well from our side. We distributed surveys to the girls and their feedback indicates that they were extremely happy and satisfied with the conference as well".

## **Concordia's Faculty of Engineering & Computer Science would like to thank the Engineers of Tomorrow Conference Organizing Committee for a job well done !**

**Your hard work and dedication to this very important event helps illustrate the calibre of students within the Faculty. We are all very proud of the effort you have all put towards making this event the great success that it was!**

### ***CENPARMI Director attends Conference on Computer Processing of Oriental Languages***

Dr. Ching Y. Suen, Director of the Centre for Pattern Recognition and Machine Intelligence (CENPARMI) recently attended an International Conference on Computer Processing on Oriental Languages in Honolulu, Hawaii. Between November 23rd and the 25th, one hundred delegates from numerous countries in Asia and North America gathered to discuss the new frontiers developing in this field. During the conference Dr. Suen presented his paper which highlighted the properties of oriental languages and the ways these languages can

be processed by a computer. He discussed the basic structure and subtleties of Oriental languages (including Chinese, Japanese and Korean) and analyzed their character shapes, formation, phonetics, semantics and syntax. He then pointed out the problems which must be solved and the challenges to be faced in order to bring further breakthroughs in computer processing of Oriental languages.

*A final report on the 1995 International Conference of Computer Processing of Oriental Languages is available on the World Wide Web at [http:// www.ics.hawaii.edu/iccpol95/U](http://www.ics.hawaii.edu/iccpol95/U)*

### **Where Have We Been?**

As some of you may have noticed the last Faculty newsletter appeared way back in May 1995....Sorry for the delay. The communications department has seen several changes in personnel which unfortunately created setbacks in some of our ongoing projects. Now that things have stabilized we hope to be able to bring you a quality quarterly newsletter on a consistent basis. Thanks for being so patient!



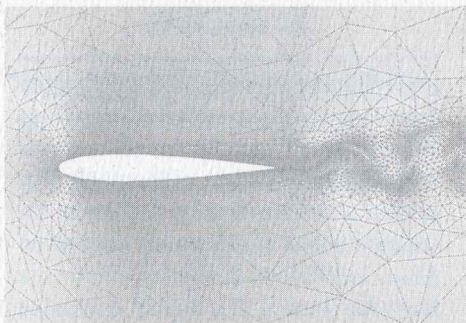
# Computational Fluid Dynamics Laboratory profiled in ICAO Journal

The Computational Fluid Dynamics Laboratory of the Department of Mechanical Engineering was profiled in a special issue of the ICAO Journal entitled the *World Area Forecast System: Toward the Final Phase*. The journal printed an article in October prepared by Lab Director, Dr. Wagdi G. Habashi, on how CFD could make significant contributions to the design of aircraft and engine ice protection systems. In the past sixty-five years aircraft and engine design and operational procedure still have not totally solved the problem of in-flight ice formation; aircraft operations in icing conditions thus continue to result in incidents and accidents. Studies show that optimal design of an ice protection system requires techniques that can accurately predict ice accretion on the entire aircraft under all atmospheric conditions. Such tools would permit the aircraft industry to:

- develop ice-resistant aerodynamic profiles
- design more effective ice detection systems
- design optimized ice protection systems
- analyze performance deterioration
- design meteorological predictions more tuned to the icing threat
- build aircraft simulators whose performance truly reflects aerodynamic behavior in icing conditions in order to better train pilots.

Today the majority of, if not all, aerospace companies have joined in the development and utilization of CFD mathematical models to simulate the flow over airfoils, wings, fuselages and entire aeroplanes and engine interiors. Such techniques are used to reduce and complement testing by permitting designers to focus on potential problem areas before a commitment is made to actual production. Thus computational fluid dynamics plays a major role in profiling, configuration and overall design of components necessary in the design of ice protection systems.

Recently, a new research initiative in Canada of which the CFD lab of Concordia University is the primary mover applied computational methods to aircraft and engine icing threats. With support from both the Canadian and Quebec governments, the aim is



Viscous flow field with adaptive grid

to regroup manufacturers, operators, government entities and pilots in a joint effort on the icing problem to bring to bear the latest mathematical tools. This is being done to provide the industry with a "numerical simulator" that can be used to improve and optimize designs, reduce testing, accelerate certification, enable investigation of situations that are difficult to reproduce and provide a more realistic training tool for pilots.

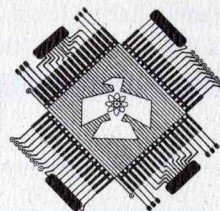
The consortium has initiated a cooperative effort for the development of a three-dimensional, Navier-Stokes-based icing code known as the Finite Element Navier-Stokes-Analysis Package (FENSAP-ICE) suitable for solving aircraft and engine icing problems. New technology has revolutionized the research at the CFD Lab. In the words of Dr. Habashi, "we propose to do far more than blindly set a box grid of, say, structured rectangles around a body and perform calculations at fixed corner points of the mesh. By monitoring the evolving solutions and knowing where ice accumulates and where important flow phenomena occur, the grid would automatically distort, move, rotate, and refine itself to put more resolution in aerodynamically intensive regions, and coarsen itself in aerodynamically-quiet zones.

The savings in solution time and the gains in precision from such technology can often be impressive." The CFD Lab shares this mesh "adaptation" technology through close collaboration with the GIREF (Groupe Interdisciplinaire de Recherche en Éléments Finis) at Laval University.

## Did You Know ?

Last year the Faculty of Engineering & Computer Science of Concordia University generated close to \$750,000 in research contracts, an amount which constituted 76% of the University total for such contracts.

## Engineering Explorations selected as Case Study



Engineering Explorations is a summer engineering camp for Aboriginal students founded in 1994 by the Faculty and the Order of Quebec Engineers. It is an initiative put forth by the Joint Working Group on Native Access to Engineering to motivate young Aboriginal people to pursue an education in engineering.

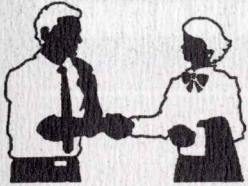
At a conference of the Council for the Advancement of Native Economic Development called Partners for Progress, held last September in Winnipeg, a book titled *Corporate Aboriginal Relations: Best Practice Case Studies* was launched.

The publication documents how leading corporations and educational institutions across Canada are implementing policies and programs to develop effective Aboriginal relations. Engineering Explorations is one such program described by the book as a case study focusing on Aboriginal Best Practice training and education.

Professor Corinne Jetté, Advisor to the Dean on Communications and Equity represented the Joint Working Group at the conference.

For further information on Engineering Explorations please contact Sonia Mitchell at 848-7847 or via e-mail: Corinne @ encs.concordia.ca





# Members of the Faculty extend their Congratulations to .....

## Dr. Wagdi G. Habashi

for his election as Fellow in the American Society of Mechanical Engineers (ASME) as of January 1996. Dr. Habashi is the Director of the Computational Fluid Dynamics Lab and Professor in the Department of Mechanical Engineering.

## Dr. S.V. Hoa

who was recently awarded a Technology Transfer Program grant in collaboration with CPF Dualam Ltd. of Montreal. The project goal is to develop and test an integrally wound thermoplastic lined fibre-glass reinforced polymer composite highway tanker for highly corrosive chemical services over a three year period. The monetary size of the project is \$679,000. This consists of cash support from NSERC as well as cash support and in kind support from the company itself. Details on Dr. Hoa's achievement will follow in the next issue.

## Dr. Stanley J. Kubina

for his election to Fellow of the Institute of Electrical and Electronics Engineers, Inc., as of January 1996. Receiving one of the Institute's most prestigious honors, Dr. Kubina was granted Fellow for his leadership in computational electromagnetics for EMC analysis and design and in electrical engineering education.

### Department of Civil Engineering

The Concordia Society of Civil Engineers (CSCE) is preparing for its annual Bridge Building Competition to be held March 15, 1996. Teams of civil engineering students from across Canada and the United States will compete for the honor of building the strongest structure made of popsicle sticks, toothpicks, dental floss and white glue. Some of these bridges have been known to withstand a ton of weight!

*For more information please contact  
Richard Tse at (514) 848-7496.*

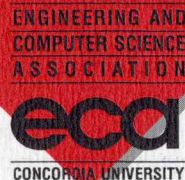


### Centre for Building Studies

The 22nd Great Northern Concrete Toboggan Race takes place in Winnipeg from February 8-10, 1996. Representing Concordia University are the Ice Falcons.

*For further information please contact  
Dave Janssen at 848-7408 or e-mail  
da\_jans@civil.concordia.ca. Info. can  
also be obtained via the web : [http://  
www.civil.concordia.ca/toboggan](http://www.civil.concordia.ca/toboggan).*

## Student News



### Department of Mechanical Engineering

CASI (Canadian Aeronautics and Space Institute) Concordia will be hosting its fifth annual Robowars event on March 29. The event will be dedicated to the memory of Dr. A.J. Saber. The main mission of the competition is to help enlarge the theoretical perspective of engineering by challenging students to create innovative robotics designs. Students will be responsible for robot design conception, assembly, operation, testing, and will be competing for first prize in the main event: the Battle Arena.

*For further information please contact  
the CASI Concordia office at 848-7910*

### Department of Mechanical Engineering

Concordia's Society of Automotive Engineers (SAE), one of the most successful student chapters in North America, is gearing up for another series of competitions;

- Aero Design Competition  
April 12, 1996  
Daytona Beach, Florida
- Mini Baja East  
May 2 - 4, 1996  
Orlando, Florida
- Super Mileage Competition  
May 31 - June 1, 1996  
Kalamazoo, Michigan
- Formula SAE  
TBD  
Detroit, Michigan
- Mini Baja Mid-West  
May 31 - June 1, 1996  
Milwaukee, Wisconsin
- Futurecar Competition  
June 10 - 19, 1996  
Detroit, Michigan

The Faculty wishes you the best of success!





# FACULTY NEWS

## Centre for Building Studies

### ◆ A.S.H.R.A.E. Chapter ◆

The Concordia University Branch of A.S.H.R.A.E. (American Society for Heating, Refrigeration and Air-Conditioning Engineers) was recently formed at Concordia with the help of Dr. Radu Zmeureanu, Associate Professor at CBS. The past semester was devoted to getting the Branch settled into its new office located at the Centre for Building Studies and to organize a few activities such as an information session to encourage people to learn more about the HVAC profession. Some of the activities for the winter semester consist of field trips, technical tours and guest speakers.

*For additional information please call (514) 848-4189.*

### ◆ Indoor Air Quality Conference ◆

The 2nd International Conference on Indoor Air Quality, Ventilation and Energy Conservation was hosted last May by the Centre for Building Studies. Chaired by Dr. Fariborz Haghighat, the conference was a success with over 200 participants from 27 countries. The Centre for Building Studies has available for purchase a two-volume set of conference proceedings.

*If interested please contact Dr. Fariborz Haghighat by calling (514) 848-3192 or e-mail [haghi@cbs-engr.concordia.ca](mailto:haghi@cbs-engr.concordia.ca)*

## Department of Computer Science

### ◆ Software Engineering Approved ◆

The University Senate has approved the Software Engineering option for the degree of Master of Computer Science. The Software Engineering programme will be offered jointly with other universities in the Montreal area.

The Diploma in Computer Science continues to be a very popular programme. This year the Department accepted a large number of highly-qualified students.

### ◆ Dept. Welcomes Dr. Kasilingam ◆

The Department welcomes Kasilingam Periyasamy as a Visiting Professor for the Winter 1996 term. Dr. Periyasamy is a graduate of the Computer Science department who is now teaching at the University of Manitoba in Winnipeg

## Department of Electrical & Computer Engineering

### ◆ Curriculum Under Review ◆

The Department is in the process of reviewing the undergraduate and graduate curriculum of both its Electrical Engineering and Computer Engineering programmes. By May of this year the committee expects to submit their revisions to the University Senate for approval, though it may be years before the revised programmes are up and running. Dr. Charles Giguère explains that it has been a number of years since either of these programmes have been reviewed and with their careful scrutiny they will be improved. He also urges students to become more involved with the review of the curriculum as well as all other aspects of the Department. Their input would prove to be valuable to future students of Electrical and Computer Engineering.

## Department of Mechanical Engineering

### ◆ Dr. Stiharu joins Department ◆

The Department of Mechanical Engineering would like to congratulate Dr. I. Stiharu on his appointment as Assistant Professor as of January 1996. Dr. Stiharu obtained his Ph.D from the Polytechnic University of Bucharest in Romania. From 1985-91 he was a member of the technical staff at the Research Institute in Computer Technology in Bucharest. His research expertise focuses on Design, Dynamics, Tribology, Micromechatronics & Micromachining.

## General Announcement : All Academic Units

### ◆ Academic Appraisals ◆

Academic Appraisals for all five Faculty units are being held this academic year. Visits from external consultants will be taking place in February and March. Appraisals are made every seven years to ensure that all Universities maintain the academic standards set by the Quebec Government. The Faculty is optimistic that the appraisals will be completed by the end of this Academic Year.

## Engineering & Computer Science

# BITS

is a quarterly publication of the Faculty's Communications Office distributed free of charge to the members of the Engineering & Computer Science Community.

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